

## OPERATIONS REPORT

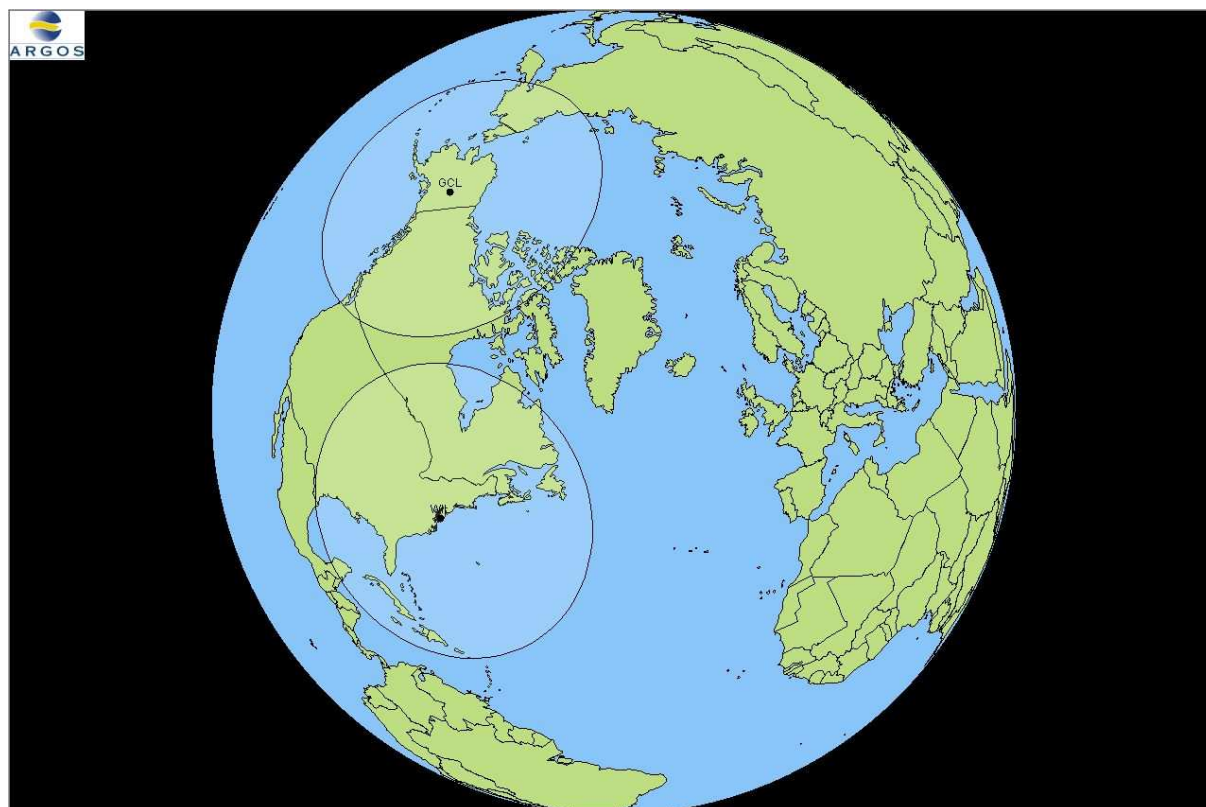
### 2006 Operations Highlights

- METOP A successful Launch
- ARGOS2001 Phase3 Pre operation
- Cape Fergusson (Queensland, AU) new real-time antenna
- CLS America Moving
- ARGOSWEB open since July, 2006

### Ground receiving stations

#### Global stations

Picture 1 shows Global stations



Picture 1

Operations were nominal on the two global stations (Fairbanks (AK, USA) and Wallops Island (VA, USA)) able to acquire the STIP telemetry.

NOAA-12, NOAA-14, NOAA-15, NOAA-16, NOAA-17 and NOAA-18 STIP data were delivered by these global stations (14 datasets per day in average except NOAA-12 and NOAA-14).

Figure 1 shows daily playback dataset acquisition into a global processing center in December 2006

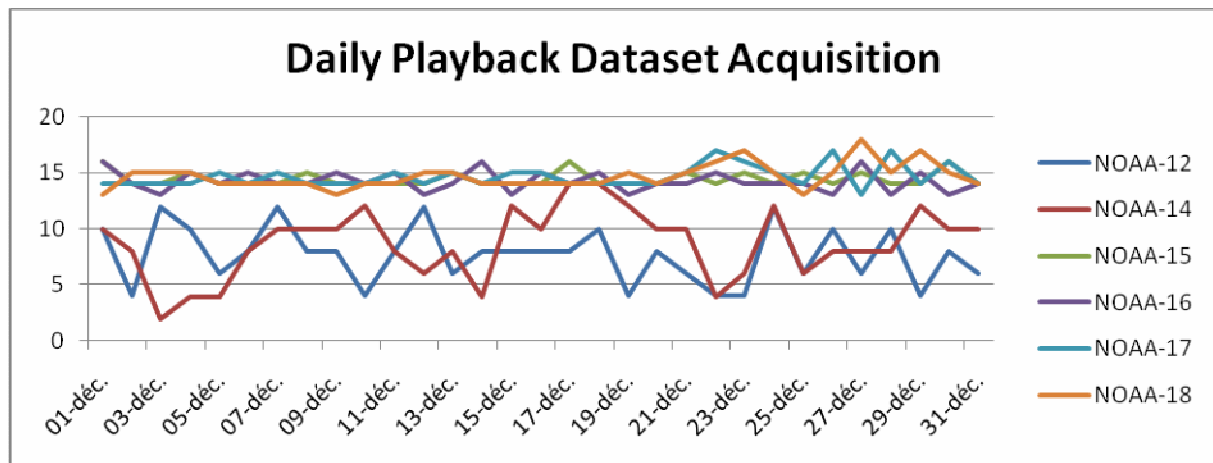


Figure 1

With these two antennas and the current ARGOS satellites constellation, we still have two blind orbits per day and per satellite. NOAA has an action item on these two blind orbits.

The STIP telemetry from NOAA-12 and NOAA-14 were delivered by group of three or four orbits.

Figures 2 to 7 show STIP dataset arrival times (On December 31<sup>st</sup>, 2006) into a Global processing Center in 2006.

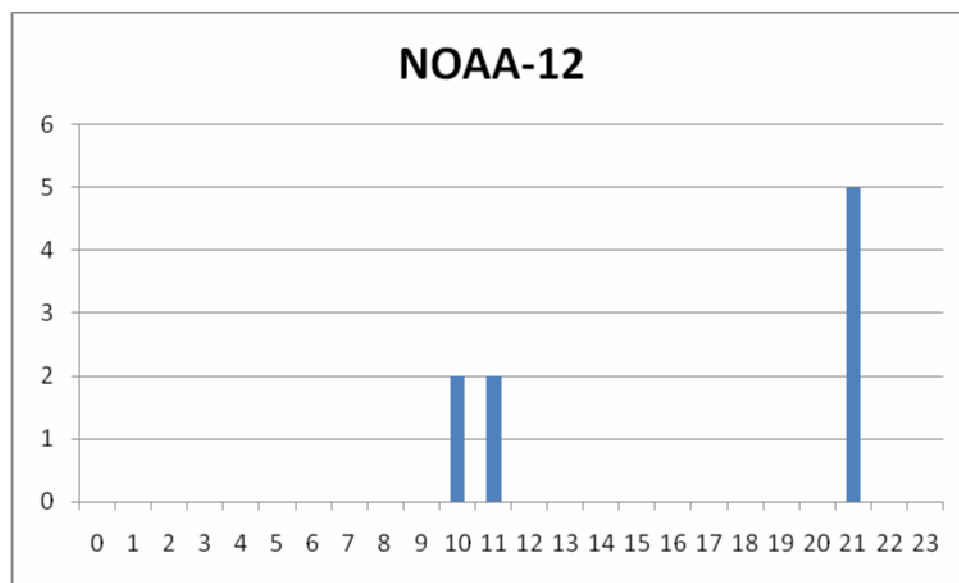


Figure 2

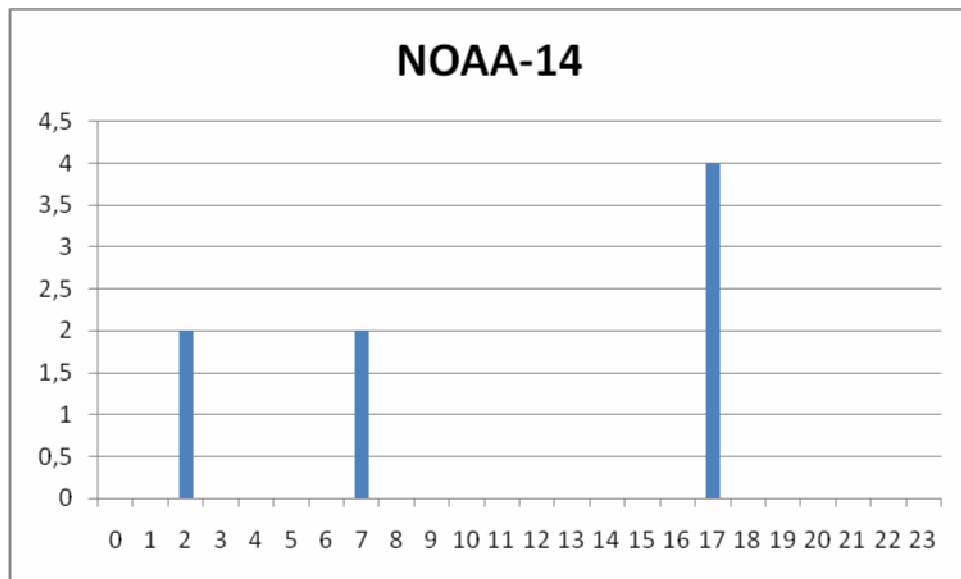


Figure 3

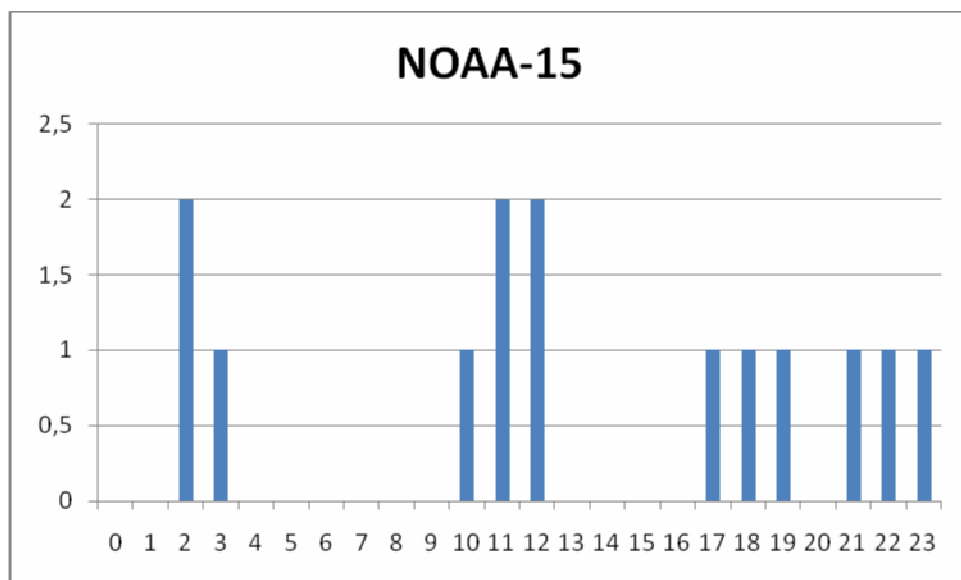


Figure 4

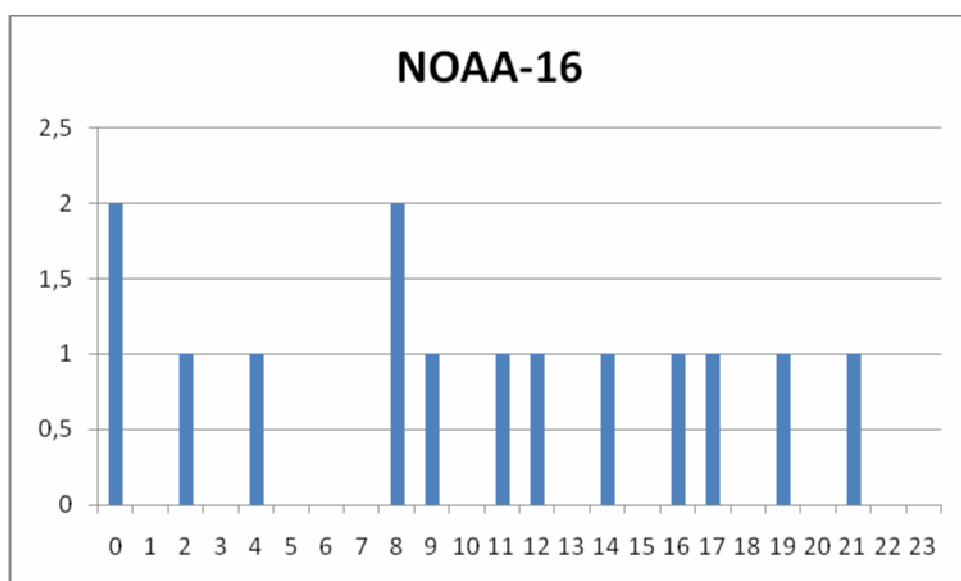


Figure 5

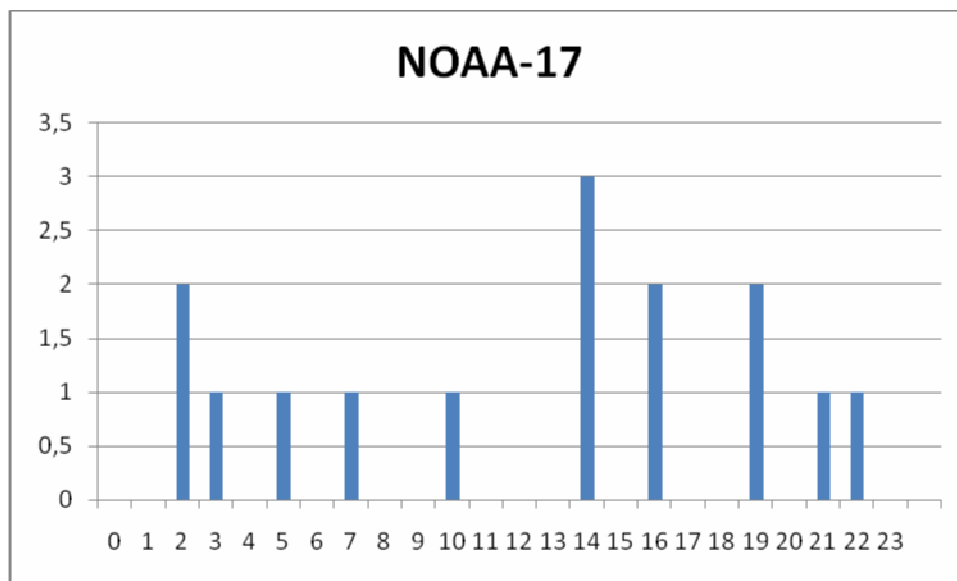


Figure 6

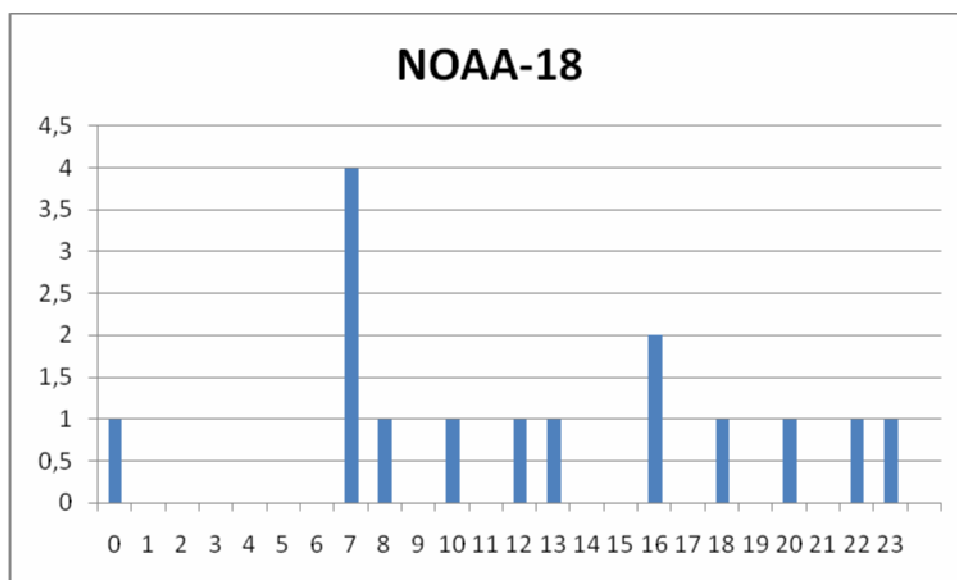


Figure 7

Figure 8 shows Local Equator crossing time (ascending node) and associated predictions for 6, 12 and 18 months in November 2006.

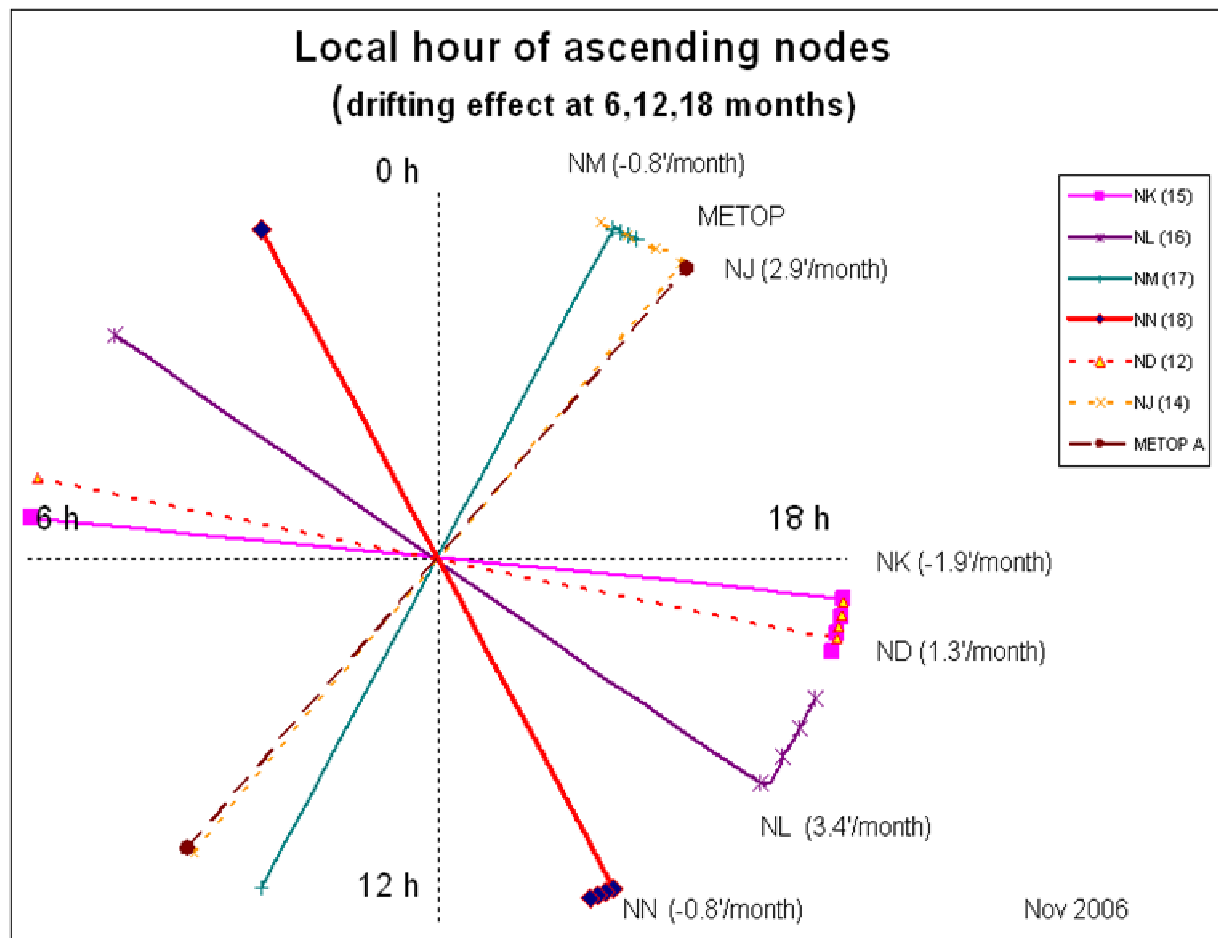


Figure 8

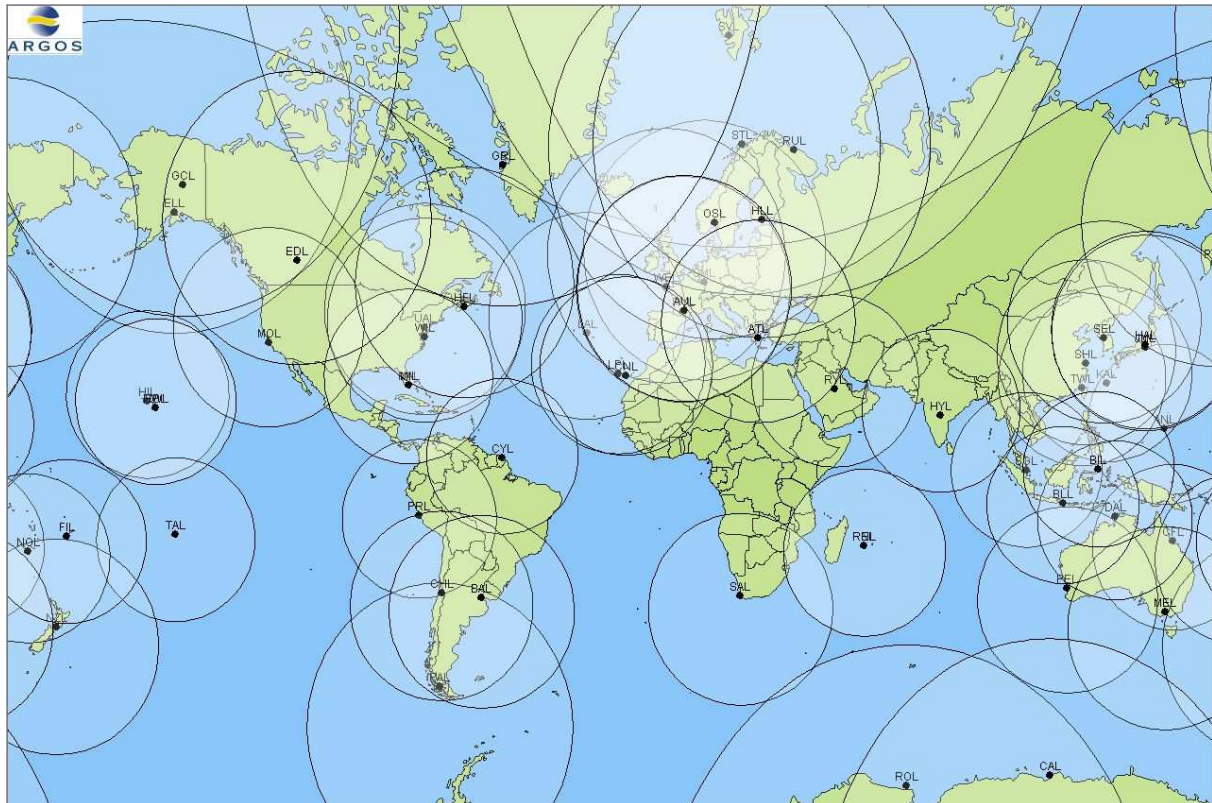
Argos constellation includes 7 satellites (See figure 9) (METOP-A Data are not delivered).

Satellites	Launch date	NOAA status	Real time data (HRPT)	Stored data (STIP)	Data AVHRR
NOAA-18 (NN)	20-May-05	Standby	ok	Gilmore, Wallops	ok
NOAA-17 (NM)	24-Jun-02	Operational	ok	Gilmore, Wallops	ok
NOAA-16 (NL)	21-Sep-00	Operational	ok	Gilmore, Wallops	ok
NOAA-15 (NK)	13-May-98	Standby	ok	Gilmore, Wallops	ok
NOAA-14 (NJ)	30-Dec-94	Standby	ok	Gilmore, Wallops	ok
NOAA-12 (ND)	14-May-91	Standby	ok	Gilmore, Wallops (2 orbits/day)	ok
METOP-A (MA)	19-Oct-06	Standby	ok	Svalbard, Gilmore	ok

Figure 9

### Regional stations

Picture 2 shows the actual real-time coverage



Picture 2

CLS and CLS America Inc. pursued their efforts in 2006 to increase and to consolidate the number of receiving stations able to provide TIP data sets from the NOAA and METOP satellites.

One station joined the Argos network during the year: Cape Fergusson (Queensland, AU). Data is provided by NOAA NESDIS.

9 new antennae are nearly ready to retrieve data from:

- Dakar (Senegal, Data-tools)
- Libreville (Gabon, CLS)

And 7 USAF antennae:

- Sembach (Air Base, Germany)
- Kadena (Air Base, Okinawa Japan)
- Andersen (Air Force Base, Guam ~Western Pacific)
- Hickam (Air Force Base, Honolulu Hawaii)
- Elmendorf (Air Force Base, Anchorage Alaska)
- Lajes (Air Base, Azores Portugal)
- Valley Forge (Lockheed Martin Development/Test system, Pennsylvania)

CLS antenna was dismantled and will be used in Libreville.

There are currently 51 stations delivering TIP data sets to CLS and CLS America Inc. Most of them process data from NOAA-18, NOAA-17, NOAA-16, NOAA-15, NOAA-14 and NOAA-12, allowing us to maintain a good throughput times for results delivery.

Bitung, Fidji and Ryadh antennae did not deliver data in 2006.

List of regional receiving stations:

Antennas	Sigle	Country	Operator	Possible satellites
Andersen USAF	AN	UNITED STATES	CLS	ND,NJ,NK,NM,NN
Athenes	AT	GREECE	CLS	ND,NJ,NK,NL,NM,NN
Aussaguel	AU	FRANCE	CLS	ND,NJ,NK,NL,NM,NN
Buenos Aires*	BA	ARGENTINA	INTA	ND,NJ,NK,NL,NM
Bitung	BI	INDONESIA	PT CLS	ND,NJ,NK,NL,NM,NN
Bali	BL	INDONESIA	PT CLS	ND,NJ,NK,NL,NM,NN
Casey	CA	AUSTRALIA	BOM	ND,NK,NL,NM
Cape Ferguson NOAA	CF	AUSTRALIA	NOAA	NL,NM,NN
Santiago	CH	CHILE	Meteo Chile	ND,NK,NL,NM,NN
Las Palmas	CN	SPAIN	CLS	ND,NJ,NK,NL,NM,NN
Cayenne	CY	FRANCE	IRD	ND,NK,NL,NM
Darwin	DA	AUSTRALIA	BOM	ND,NK,NM
Ewa Beach Oahu NOAA	EB	UNITED STATES	NOAA/NWS	ND,NK,NL,NM,NN
Edmonton	ED	CANADA	Envir. Canada	ND,NK,NL,NM
Elmendorf USAF	EL	UNITED STATES	CLS	ND,NJ,NK,NM,NN
Fidji	FI	FIJI	FMS	ND,NK,NM
Gilmore	GC	UNITED STATES	NOAA/NESDIS	ND,NJ,NK,NL,NM,NN
Sondre	GR	GREENLAND	DMI	NK,NL,NM
Hatoyama	HA	JAPAN	NASDA/EOC	ND,NJ,NM
Halifax	HF	CANADA	Can. Coast Guard	ND,NK,NL,NM
Hickam USAF	HI	UNITED STATES	CLS	ND,NJ,NK,NL,NM,NN
Helsinki	HL	FINLAND	CLS	ND,NJ,NK,NL,NM,NN
Hawai	HW	UNITED STATES	NOAA/NWS	ND,NK,NL,NM
Hyderabad	HY	INDIA	INCOIS	ND,NJ,NK,NL,NM,NN
Tokyo	JM	JAPAN	Jamstec	ND,NJ,NK,NL,NM,NN
Kandena USAF	KA	JAPAN	CLS	ND,NJ,NK,NM,NN
Lajes USAF	LA	SPAIN	CLS	ND,NJ,NK,NM,NN
Lima METOP	LM	PERU	CLS Perou	MA,ND,NJ,NK,NL,NM,NN
Las Palmas	LP	SPAIN	Univ. Las Palmas	ND,NJ,NK,NL,NM
Miami NOAA	MA	UNITED STATES	NOAA/AOML	NK,NL,NM
Melbourne	ME	AUSTRALIA	BOM	ND,NJ,NK,NL,NM,NN
Miami NESDIS	MI	UNITED STATES	NOAA/AOML	NK,NL,NM
Montererey	MO	UNITED STATES	NESDIS/NWS	NL,NM,NN
Noumea Meteo France	NC	NEW CALEDONIA	Meteo France	ND,NK,NM,NN
Noumea IRD	NO	FRANCE	IRD	NK,NM
Wellington	NZ	NEW ZEALAND	Met Office	NK,NL,NM
Oslo	OS	NORWAY	NMI	NJ,NK,NL,NM,NN
Punta Arenas	PA	CHILE	Meteo Chile	NK,NL,NM
Perth	PE	AUSTRALIA	BOM	ND,NJ,NK,NL,NM,NN
Lima	PR	PERU	CLS peru	ND,NJ,NK,NL,NM,NN
Petropavlosk	PT	RUSSIAN FEDERATION	Complex System	ND,NJ,NK,NL,NM,NN
Ile de la Reunion	RE	FRANCE	IRD	NK,NL,NM
Ile de la Reunion	RN	FRANCE	Meteo France	NL,NM
Rothera	RO	INDONESIA	PT CLS	NJ,NK,NL,NM,NN
Murmansk	RU	RUSSIAN FEDERATION	Complex System	ND,NJ,NK,NL,NM,NN
Toulouse	RV	FRANCE	CLS	ND,NJ,NK,NL,NM,NN
Ryad	RY	UNITED ARAB EMIRATES	CLS	ND,NJ,NK,NL,NM,NN



Cape Town	SA	SOUTH AFRICA	CLS/SAWB	ND,NJ,NK,NL,NM,NN
Seoul	SE	KOREA, REPUBLIC OF	KMA	ND,NK,NL,NM,NN
Singapore	SG	CHINA	SMM	ND,NK,NM
Shanghai	SH	CHINA	East China Sea Fisheries	ND,NK,NL,NM,NN
Sembach USAF	SM	GERMANY	CLS	ND,NJ,NK,NM,NN
Tromsoe	ST	NORWAY	KSAT	NK,NL,NM,NN
Papeete	TA	FRANCE	IRD	ND,NK,NL,NM,NN
Taiwan	TW	TAIWAN, REPUBLIC OF CHINA	National Taiwan Ocean Uni	NK,NL,NM,NN
Valley Forge USAF	UA	UNITED STATES	CLS	ND,NJ,NK,NL,NM,NN
Lannion	WE	FRANCE	Meteo France	NL,NM,NN
Wallops	WI	UNITED STATES	NOAA/NESDIS	ND,NJ,NK,NL,NM,NN

\* the only station to locate the satellites when they are situated at a 20° or greater site angle

Antennas under agreement
CLS and subsidiaries antennas
Customer antennas under CLS maintenance contract
Antennas without written agreement ("Best effort")

Future METOP real-time coverage is shown on Picture 3.



Picture 3

Today, Bali and Toulouse are fully operational with METOP real-time.

Figure 10 shows daily real-time dataset acquisition into a global processing center in December 2006. High tracking Priority is given to NOAA-18 and Low priority tracking to NOAA-14.



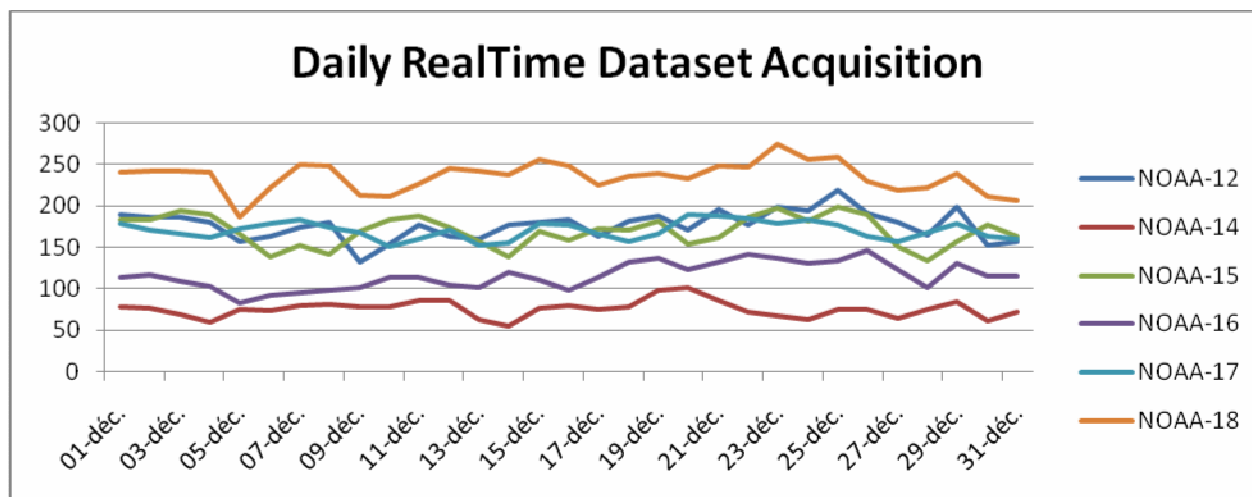


Figure 10

#### Orbitography PTT network

1- TOULOUSE	OK
108 - GILMORE_N	OK
109 - KOUROU_N	OK
111 - HARTBEES_N2	Small amount data on NOAA 12
112 - CANBERRA_N	OK
113 - LIMA-N	OK
114 - KRASNOIARSK	Stopped on 01/26/06. Expecting administrative paper in order to restart this PTT. A. Salman in charge.
116 - PAPEETE	OK
118 - WALLOPS	OK
119 - KERGUELEN_N	OK
149 - PERTH	OK
110 - MOJAVE	Stopped on 12/12/06. Power problem. CLS America in charge.

An action item should be taken to review all PTT location agreements.

#### **Processing centers**

Picture 4 displays all CLS processing centers.



Picture 4

### Global processing centers

The two global processing centers in Toulouse and Largo were nominal. More than 1000 data sets per day (80 STIP data sets, 1000 Real-time data sets) are processed in each centers (see Figure 11).

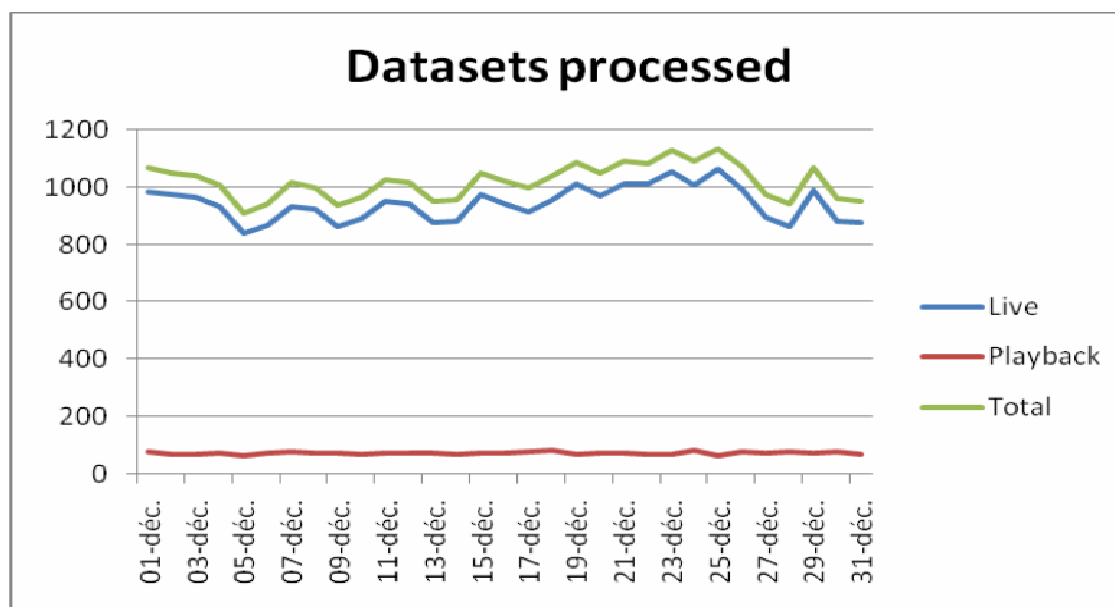


Figure 11

No major software changes were done into both global processing centers in 2006. Operational teams were trained in order to operate the redesign Argos software: Argos2001 (Phase3). Opening is scheduled in April 2006.

ARGOSWEB [www.argos-system.org](http://www.argos-system.org) was deployed at CLS in July, 2006

CLS America, Inc. has moved. No major interruptions were noticed. Power outages in August were covered by CLS, France.

CLS is executing a power outage test once a year. The one in October 2006 went really well and all SOPs were reviewed. CLS America, Inc was in backup mode during the test.

### **Regional Processing Centers**

The regional processing center in Djakarta (Indonesia) has encountered hardware problem in early 2006. During the maintenance (3 months), all services were provided by the Toulouse and Largo centers. Lima (Peru) and Tokyo (Japan) centers were nominal.

Reminder: All the regional processing centers in Tokyo, Lima and Djakarta only process data sets from stations covering their region. Supplementary data providing global coverage are supplied by the Toulouse center or by the Largos center if necessary.

### **Communication links**

CLS and CLS America have improved is Internet link and are now connected each other to 2 different providers: Two T1 (1,5M) for CLS America and two lines (2M and 4M) for CLS.

The Internet is still the main communication link used to distribute processed data to users and to retrieve data sets from receiving stations. Security functionalities are available SSH, PGP, HTTPS.

The X25 protocol is only used and maintained by the Toulouse center to send data to a few users (less than 20) concerned by security reasons.

### **Statistics**

#### **Daily and Monthly Active PTT**

The number of Argos platforms operating continues to increase. In May 2006, more than 9000 platforms were seen on average per day. However, each of the two global centers processed data from 16 500 individual platforms during this month (figure 12).

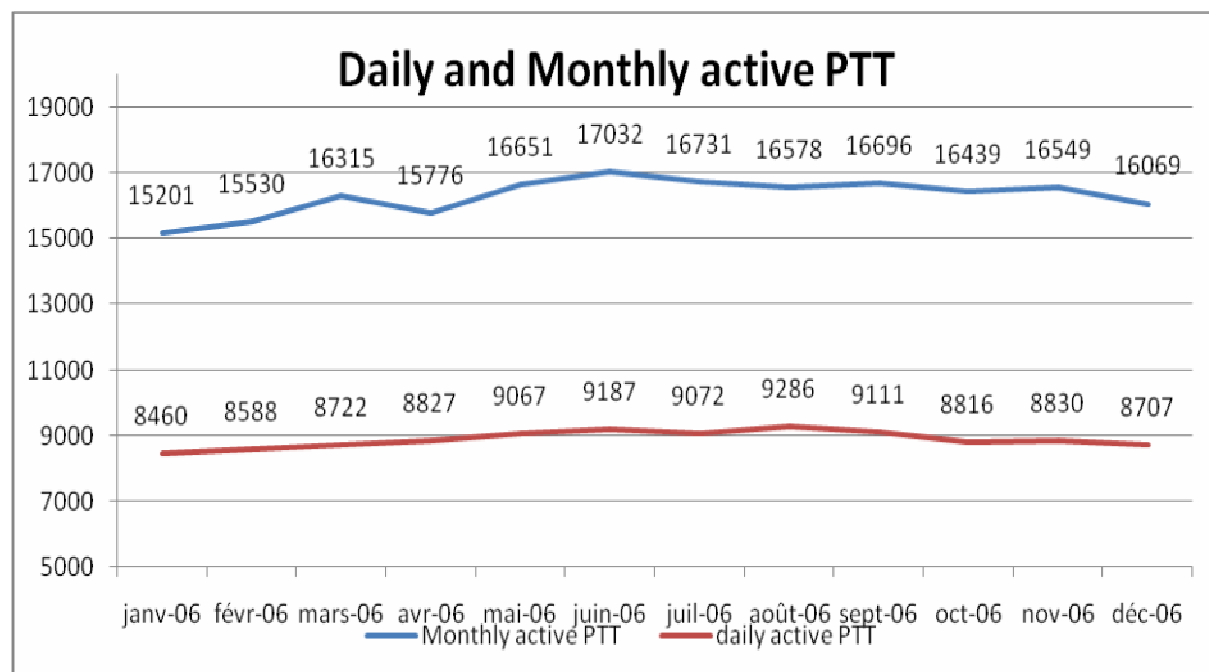


Figure 12

#### **TELNET access**

Figure 13 shows the connexion number on July 1<sup>st</sup>, 2006 and the user number using TELNET that day.

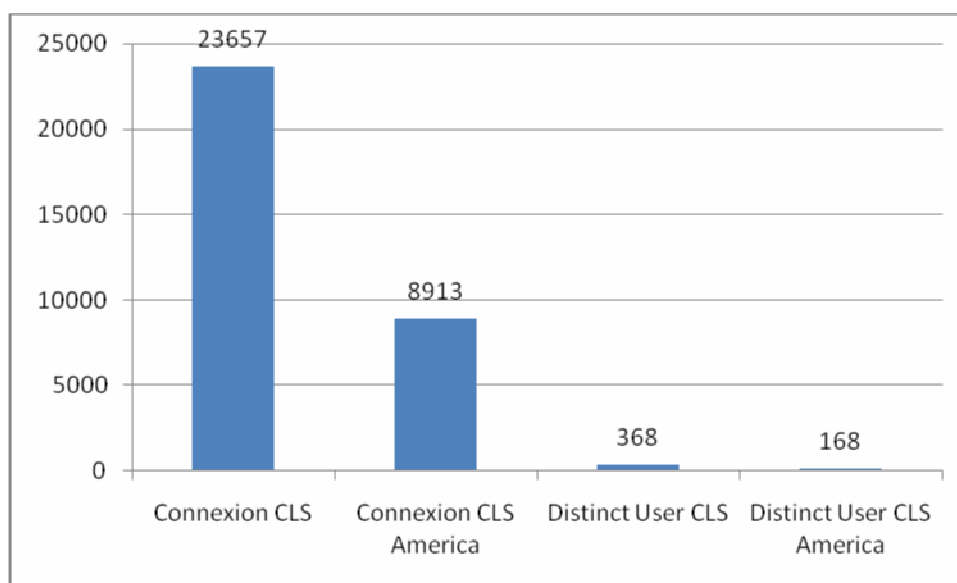


Figure 13

Figure 14 shows the number of commands used on July 1<sup>st</sup>, 2006 per ARGOS available commands

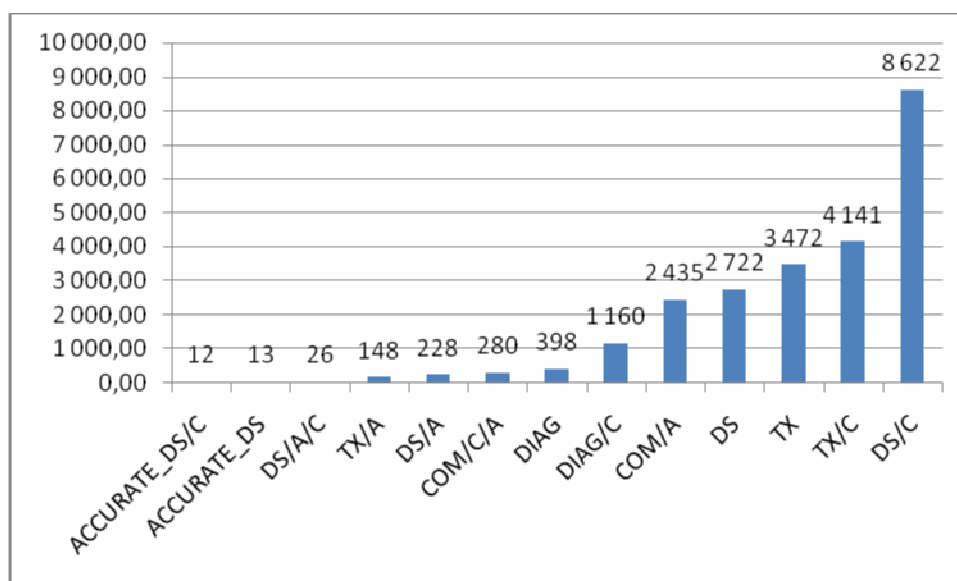


Figure 14

#### ARGOSWEB access

Figure 15 shows average connections per hour on ARGOSWEB.

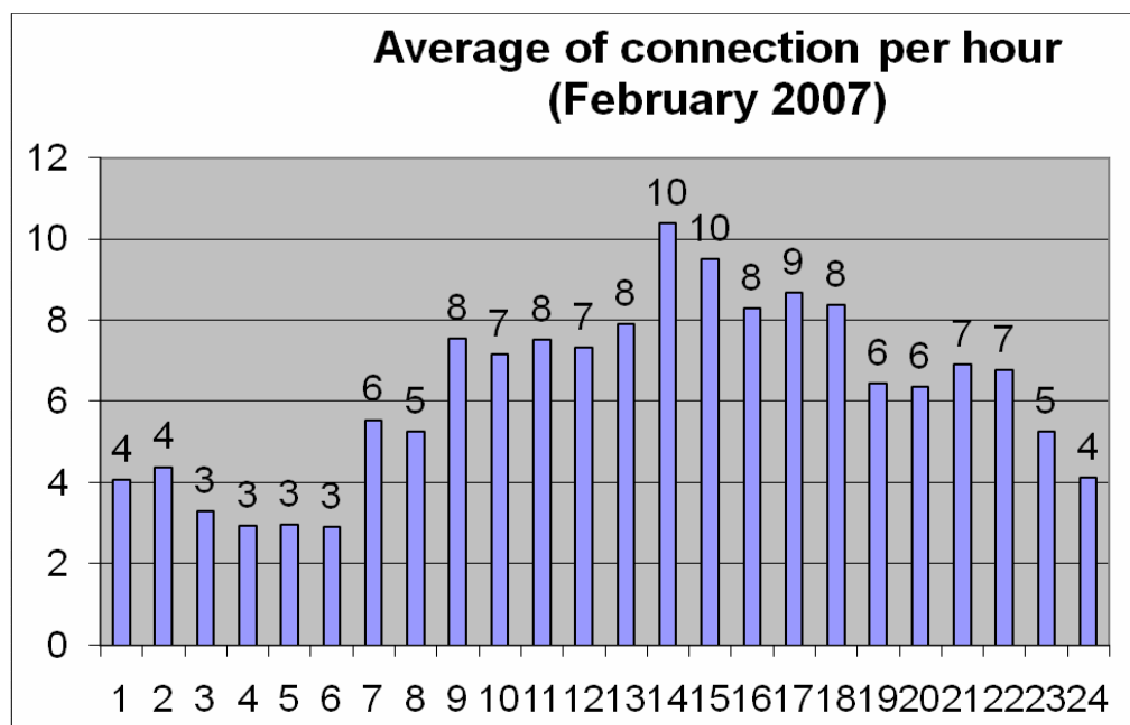


Figure 15

In average, ARGOSWEB receives 100 connexions per day (70 during the W-E).

#### ARGOS Messages

In 2006, the number of locations and messages computed every day by the Largo and Toulouse centers are, in average, 70 000 locations and 1 000 000 messages.

#### Access availability

The average availability is 99,6% in 2006.

Figure 16 shows the ARGOS2001 availability at CLS in 2006. During the unavailability of the services in CLS, CLS America, Inc. was on backup.

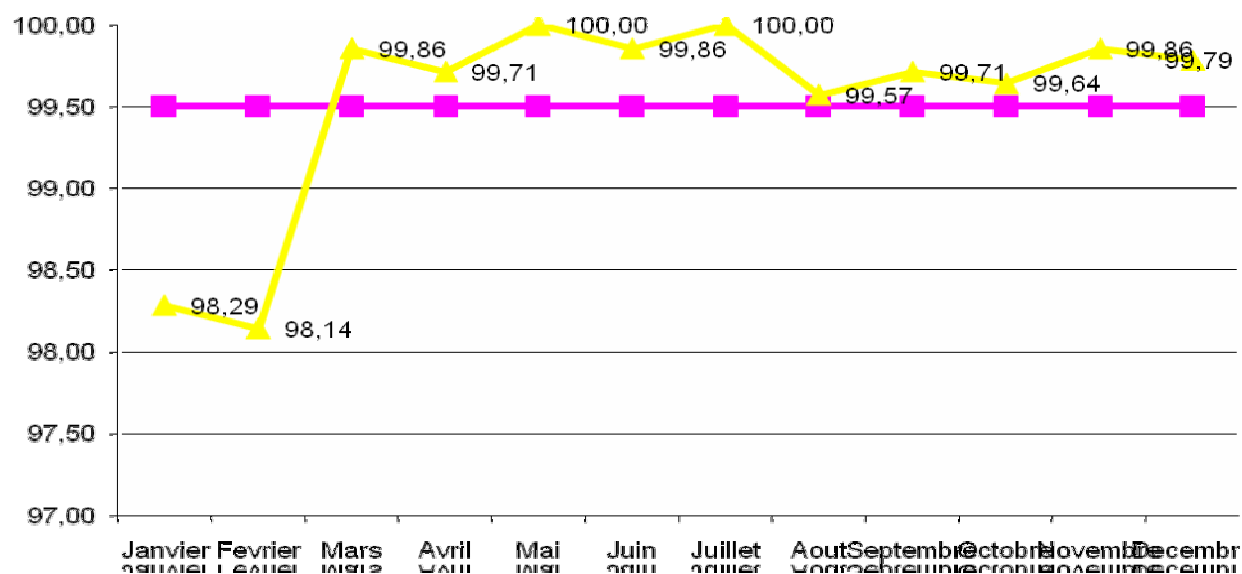


Figure 16

In January and February 2006, ARGOS availability system was impacted by an TELNET consultation anomaly.

## **2007 Perspectives**

- New antennae in Gabon and Senegal (Central Africa) + 9 USAF Antenna
- Disaster Recovery implementation
- ARGOS2001 Phase3 in operation
- Monthly Argos operation report available\*

\* Throughput times calculation have been redefined and will be implemented in 2006. Statistics on throughput times will be again available in 2006.